Federal Democratic Republic of Ethiopia

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ET ISO 9051 (2001) (English): Glass in building -- Fire-resistant glazed assemblies containing transparent or translucent glass, for use in building

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ETHIOPIAN STANDARD

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(Identical with ISO 9051:2001)

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Ceramic, terracotta building materials and glass (TC 37) and published by the Ethiopian Standards Agency (ESA).

The standard is identical with ISO 9051:2001 Glassinbuilding—Fire-resistant glazed assemblies containing transparentor translucentglass,for use in building published by International organization for standardization(ISO).

For the purpose of this Ethiopian Standard , the adopted text shall be modified as follows.
- The phrase “International Standard” shall be read as “Ethiopian Standard”; and
- A full stop (.) shall substitute comma (,) as decimal marker.

Glass in building — Fire-resistant glazed assemblies containing transparent or translucent glass, for use in building

1 Scope

This International Standard specifies the classification and marking of transparent and translucent glass products, which will be described in future International Standards on basic or processed glass products, in assemblies for use in building and intended to provide some degree of fire-resistance.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 834-1:1999, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

ISO 3009, *Fire resistance tests — Elements of building construction — Glazed elements*

3 Fire-resistance characteristics of glazed assemblies

Glass is a non-combustible material and therefore will not contribute to or propagate fire.

If affected by heat, glass may fracture by thermal shock or may soften and then not be held by the frame. Only certain types of glazed assemblies are, therefore, recognized as fire-resisting. The ability of glazed assemblies to resist fire depends on the type of glass product, glazing method, frame type, pane size, fixing method and the type of construction surrounding the glazed area.

Some transparent and translucent glazed assemblies can meet requirements for stability and integrity (RE), and in some cases insulation (REI, where R is for resistance, E for integrity and I for insulation).

Not only is the possibility of direct propagation of fire and smoke through openings caused by glass breakage to be considered for fire protection precautions, it may also be necessary to take into account the heat transmitted through the glazed assembly, which may still be intact, as such heat may cause ignition of combustible materials.

4 Classes

As glazed assemblies perform differently in case of fire, the type shall be classified into one of the following categories.

a) **Class RE**

Glazed assemblies of fire-resistance according to class RE under the fire conditions as defined in ISO 834-1 provide, for a given time, stability and integrity. The temperature of the unexposed side is not taken into account.

b) **Class REI**

Glazed assemblies of fire-resistance according to class REI under the fire conditions as defined in ISO 834-1 provide, for a given time, stability, integrity and insulation.

5 Frame, glass, glazing material and surrounding construction

The frame, glazing material and surrounding construction shall be such that the glazed assembly as a whole corresponds to the test report.

Glazings of class RE could, for example, contain

- glass blocks,
- glass with a low coefficient of thermal expansion, or glass ceramics,
- glass toughened by thermal or chemical treatment,
- wired glass,
- flat glass in small panes, or
- laminated glass,

in single or multiple glazings.

Glazings of class REI could, for example, contain

- some types of glass blocks, or
- some types of laminated glazings in single or multiple glazings.

6 Test requirements

6.1 Specimens

A specimen, for the purposes of this International Standard, is a complete glazed assembly.

6.2 Installation

The fixing of the specimen into the furnace opening shall be in accordance with ISO 3009.

6.3 Procedure

The test procedure shall be in accordance with ISO 3009, and for the temperature of the unexposed side (class REI), see ISO 834-1:1999, subclause 5.5.12, with at least one thermocouple for the measurement of the maximum temperature on the glazing.

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6.4 Criteria

A glazed assembly for fire-resistance class RE shall meet the integrity requirements of ISO 3009 (see Table 1).

A glazed assembly for fire-resistance class REI shall meet both the integrity requirements of ISO 3009 and the insulation requirements of ISO 834-1 (see Table 1).

7 Test report

The test report shall state the following information:

a) name of test laboratory;

b) name of sponsor(s);

c) date of tests;

d) name(s) of manufacturer(s) and trade name(s) (if any) of the major components of the glazed assembly;

e) details of materials, construction and conditioning of the assembly tested;

f) description of the fixings between the assembly tested and the test frame or surround;

g) side exposed to heat;

h) test result as determined by the furnace time/pressure chart and temperature curves, and the time(s) at which particular criteria in 6.4 are no longer satisfied;

i) any other relevant observations;

j) fire-resistance class(es) RE and/or REI and code number(s) according to Table 1.

Table 1 — Fire-resistance time

Code number	**Resistance time** min
15	15 to 29
30	30 to 44
45	45 to 59
60	60 to 89
90	90 to 119
120	120 or more

8 Marking

If marking is essential, the following particulars shall be indelibly and distinctly marked on every glazed assembly, in a position which is visible to anyone requiring the information:

a) manufacturer’s name or trademark;

b) the number of this International Standard, i.e. ISO 9051;

c) fire-resistance class RE and/or REI;

d) code number(s) for the resistance time(s).

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- Facilitate the country's technology transfer through the use of standards,
- Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.
Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

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